1. Recognize that CTE provides the relevance needed for core subjects and should be positioned as an avenue for core subject credit in areas such as math, language arts and science

National Drop-out Prevention category: Career and Technical Education (CTE)

Background:

Students, themselves, report the need for more relevance in high school. The 2006 report sponsored by the Gates Foundation "The Silent Epidemic: Perspectives of High School Dropouts" states that the decision to drop out is not a sudden act, but is a gradual process of disengagement. 47% of dropouts indicated that a major reason for dropping out was that the classes weren't interesting. 81% stated that additional opportunities for "real-world learning" and "to see the connection between school and getting a good job" may have encouraged them to finish high school.

The academic community agrees. The International Center for Leadership in Education states that "research has validated that relevance makes rigor possible within academic content…. The process of identifying and analyzing academic content embedded in CTE programs has been a complex and time consuming process that provides a valid basis for policy decision relative to potential academic credit for CTE programs."

Federal policy has validated these points of view. Since 2006, Federal Perkins Act funds require that programs "must improve the academic and technical skills of students … through the integration of coherent and rigorous content aligned with challenging academic standards and relevant career and technical education programs…"

With so much support for adding high school relevance through CTE, what are the best practices, and what is currently being done?

The Association for Career and Technical Education states that career and technical education courses have often been overlooked in the public debate about making sure that students are exposed to rigorous academic content. However, the recognition of academic credit for CTE coursework is an innovative approach that helps students' gain deeper understanding of academic content while earning more and higher levels of academic credit toward their high school diploma. ACTE also points out that many states, including Arizona, recently increased academic course taking requirements. This creates the concern that ratcheting up graduation requirements without new engaging forms of teaching and learning will simply encourage more struggling students to drop out. In addition, increased graduation requirements for math and science "squeeze out" other important segments like social studies and foreign languages, and leave even fewer open slots for electives – where CTE is often placed.

ACTE differentiates between two methods of creating courses with academic credit. First, is a hybrid that consists of fully integrated academic and CTE content and is structured so that it counts for both academic and elective CTE credit on a student's high school transcript, and gives the student two credits. Second, is a CTE course that meets academic credit requirement for graduation for full or partial credit

toward high school graduation. For example, a pre-engineering course may fulfill a science credit requirement, but is only worth one credit.

ACTE lists three key factors in implementation:

1. Develop a systematic process for course approval
2. Address the Highly Qualified Teacher requirement
3. Secure buy in from key stakeholders

The National Research center for Career and Technical Education reports that key to embedding academic rigor in a CTE course is to think of the course as neither a math nor a CTE course, but rather as a "Math-in-CTE" course. In this case, a key element of "Math-in-CTE" is the professional development of the CTE teacher, with a math teacher partner. One "surprise" benefit discovered in an experimental research project to determine the effects of this approach on student achievement, is that the math teacher partner also used "Math-in-CTE" principles beyond their traditional academic content. More importantly, the research study showed that students in "Math-in-CTE" courses had positive gains compared to their peers on standardized assessments.

Arizona context:

The decision to allow academic credit for a CTE course resides at the local school board level, and the Arizona Department of Education has created guides for local school boards to use in making the determination. In 2009 the Arizona Department of Education developed "Math-in-CTE program standards crosswalks". These documents link academic math standards by each performance objective to the standards and measurement criteria associated with the CTE program. For example, the academic math standard of "Structure and logic, logical reasoning, problem solving and proof; evaluate a solution for reasonableness and interpret the meaning of the solution in the context of the original problem" and "synthesize mathematical information from multiple sources to draw a conclusion, make inferences based on mathematical information, evaluate the conclusions of others, analyze a mathematical argument, and recognize flaws or gaps in reasoning" are aligned the Architectural Drafting standards of "identify conflicting data."

CTE Subjects which have academic crosswalks are:

- Accounting services
- Architectural drafting
- Automotive technologies
- Cabinetmaking
- Construction technologies
- Electronic drafting
- Engineering sciences
- Financial services
- Mechanical drafting

In addition, the Pima County JTED began an alignment process to identify which CTE courses should qualify for academic credit, and what type of credit that should be. They have indicated a need for $50,000 to complete the work for math.

Based in the ACTE framework described above, Arizona has the guidelines and foundation to assist local school boards in course approval. However the highly Qualified Teacher Requirement limits the number of teachers available to teach these courses. Often, CTE teachers are not considered "highly qualified" in the related academic course. While other barriers exist related to University entrance requirements (allowing for either ART OR CTE, forcing a student to chose) and other issues, there is growing buy-in from stakeholders that this is a process worth pursuing. For example, former State Board of Education President Jaime Molera frequently identified the need to encourage academic credit for more CTE courses, and it has been listed as a focus area in the annual SBE strategic planning. Superintendent Huppenthal has also identified strengthened CTE as a priority.

Available Actions:

a) Find funding source for Pima JTED to complete math-CTE crosswalk
b) Remove barriers / encourage local school boards to approve academic credit for CTE courses
   - Support the opportunities for "team teaching" between academic and CTE teachers to allow for Highly Qualified Teachers to allow for academic credit
     Q: Are there other ways to address HQT requirements?
   - Work with Arizona School Boards Association to generate buy-in and education school boards on the process
     Q: Does ADE need any support in this?
c) Support professional development programs of "Math-in-CTE"
d) Streamline HQT processes for CTE teachers to be able to teach academic content
e) Encourage revision of administrative code (R72-302 item f) to allow one credit of fine arts AND/OR vocational education, and other revisions as needed
f) Work with ABOR to revise admission requirements to include Arts AND/OR CTE rather than Arts OR CTE (is this the same recommendation as above?)
g) Other ideas?